

CLAIMS

What is claimed is:

- 1 1. A method, comprising:
2 at least partially dicing a semiconductor wafer having a low-K interlayer
3 dielectric (ILD) layer;
4 applying a tape to a front side of the partially diced semiconductor wafer;
5 and
6 grinding a backside of the taped partially-diced semiconductor wafer.
- 1 2. The method of claim 1 wherein at least partially dicing the semiconductor
2 wafer includes:
3 laser scribing the semiconductor wafer; and
4 dicing the semiconductor wafer.
- 1 3. The method of claim 2 wherein laser scribing the semiconductor wafer
2 includes forming at least one trench along streets separating adjacent
3 semiconductor devices.
- 1 4. The method of claim 1, further comprising:
2 mounting the taped partially-diced semiconductor wafer having its
3 backside grinded; and
4 removing the tape from the front side of the taped partially-diced
5 semiconductor wafer.

1 5. The method of claim 1, further comprising:
2 attaching an adhesive to the backside of the semiconductor wafer; and
3 wherein at least partially dicing the semiconductor wafer includes:
4 scribing lines along streets on the front side of the semiconductor
5 wafer; and
6 cutting the semiconductor wafer along the streets of the
7 semiconductor wafer with scribed lines.

1 6. The method of claim 5, further comprising:
2 cutting the tape and the adhesive attached to the backside of the
3 semiconductor wafer to substantially define a perimeter of the semiconductor
4 wafer; and
5 removing the adhesive from the backside of the partially diced
6 semiconductor wafer.

1 7. The method of claim 5, further comprising:
2 mounting the partially diced semiconductor wafer having its backside
3 grinded; and
4 detaping the tape from the front side of the partially diced semiconductor
5 wafer.

1 8. A method of thinning a semiconductor wafer, the method comprising:
2 attaching an adhesive to a backside of the semiconductor wafer;
3 scribing lines along streets separating integrated circuit devices along a
4 front side of the semiconductor wafer;
5 cutting the semiconductor wafer along the streets of the semiconductor

6 wafer with the scribed lines;

7 applying a protective layer onto at least a portion of the front side of the
8 semiconductor wafer;

9 cutting the protective layer and the adhesive attached to the backside of
10 the semiconductor wafer to define a perimeter of the semiconductor wafer; and
11 grinding the backside of the semiconductor wafer to reduce a thickness of
12 the semiconductor wafer.

1 9. The method of claim 8 wherein the semiconductor wafer includes an
2 interlayer dielectric (ILD) layer having a low dielectric constant (K).

1 10. The method of claim 9 wherein scribing lines along the streets includes
2 laser scribing through the ILD layer having a low dielectric constant (K).

1 11. The method of claim 8 wherein scribing lines along the streets includes
2 scribing two lines substantially along either side of each street.

1 12. The method of claim 8 wherein applying the protective layer includes
2 applying a protective coating.

1 13. The method of claim 8, further comprising removing the protective layer.

1 14. The method of claim 8 further comprising, removing the adhesive cut to
2 define the perimeter of the semiconductor wafer.

1 15. The method of claim 8, wherein the protective layer includes a backgrind
2 tape.

- 1 16. The method of claim 8, further comprising:
2 mounting the semiconductor wafer having its backside grinded; and
3 removing the protective layer from the front side of the wafer.
- 1 17. A method, comprising:
2 a least partially dicing a semiconductor wafer having a low-K interlayer
3 dielectric (ILD) layer to form a plurality of cuts in the semiconductor wafer;
4 taping a first side of the semiconductor wafer across at least some of the
5 cuts; and
6 grinding a second side of the semiconductor wafer.
- 1 18. The method of claim 17 wherein at least partially dicing the semiconductor
2 wafer to form the plurality of cuts includes:
3 laser scribing through the low-K ILD layer to form trenches in the low-K
4 ILD layer; and
5 sawing the semiconductor wafer along the formed trenches to singulate
6 the semiconductor wafer.
- 1 19. The method of claim 18, wherein laser scribing through the low-K ILD
2 layer includes scribing two lines along streets separating adjacent semiconductor
3 devices.
- 1 20. The method of claim 17, further comprising mounting the semiconductor
2 wafer before at least partially dicing the semiconductor wafer.
- 1 21. The method of claim 20 further comprising:
2 cutting a tape applied to the first side of the partially-diced semiconductor

3 wafer across at least some of the cuts to approximate the semiconductor wafer
4 shape; and
5 removing an adhesive used to mount the semiconductor wafer.

6 22. The method of claim 21, further comprising, cutting the adhesive used to
7 mount the semiconductor wafer to approximate the semiconductor wafer shape
8 before removing the adhesive.

1 23. The method of claim 21 wherein the adhesive is a mounting tape.

1 24. The method of claim 17, further comprising mounting the partially diced
2 semiconductor wafer having its second side grinded onto a wafer frame.

1 25. The method of claim 24, further comprising removing a tape applied to the
2 first side of the partially diced semiconductor wafer across at least some of the
3 cuts.

1 26. The method of claim 17 further comprising using a vacuum transfer device
2 to place the partially diced semiconductor wafer onto a surface to tape the first
3 side of the semiconductor wafer across at least some of the cuts.

1 27. The method of claim 17 wherein at least partially dicing the
2 semiconductor wafer includes partially dicing the semiconductor wafer in a
3 manner that the cuts substantially prevent cracks from propagating across the
4 semiconductor wafer when the semiconductor wafer is singulated.